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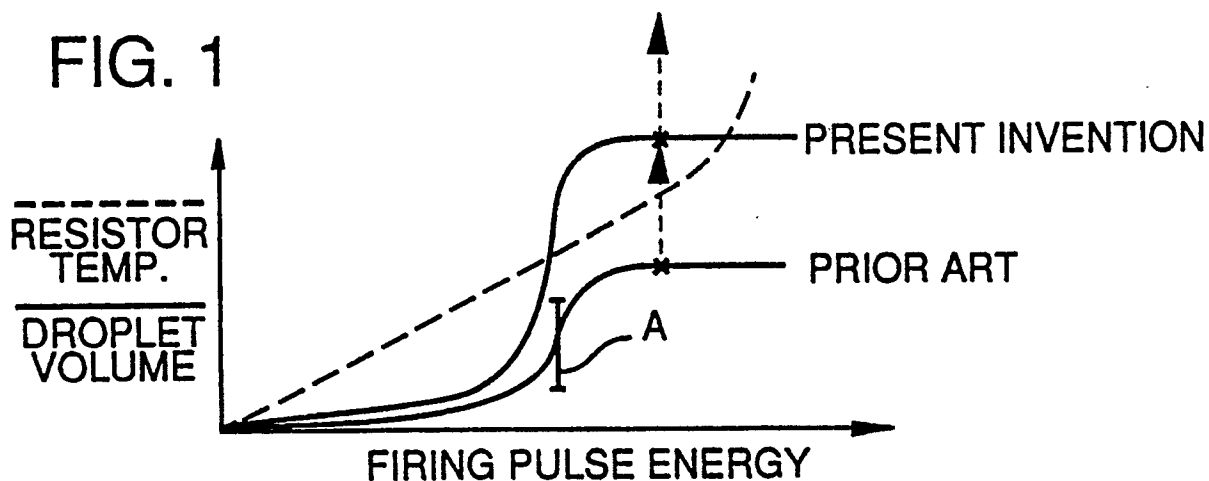
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(54) **Method and apparatus for gray scale printing with a thermal ink jet pen.**

(57) The firing resistor (18) in a thermal ink jet pen (19) is driven by two signals in sequence. The first signal is a warming signal, tailored to transfer a desired quantity of thermal energy to the ink in the firing nozzle. The second signal is a firing pulse

tailored to vaporise ink adjacent the resistor and thereby eject a bubble of ink from the nozzle. by varying the degree of prewarming, the droplets ejected by the firing pulse can be varied in volume, thereby effecting gray scale printing.

FIG. 1



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EUROPEAN SEARCH REPORT

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EP 89 31 2991

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	US-A-4 563 689 (K. MURAKAMI et al.) * abstract; column 3, line 58 - column 4, line 17; column 7, lines 23-34; claim 1; figures 6,8A-8C *	1-3,11	B 41 J 2/205 B 41 J 2/05
Y	---	4-7,10	
Y	EP-A-0 205 243 (ING. C. OLIVETTI) * abstract; claim 1; figure 3 *	4-7	
A	---	1-3,11	
Y	US-A-4 463 359 (N. AYATA et al.) * abstract; column 5, line 51 - column 6, line 9; figure 4 *	10	
A	---	1-9,11	
D,A	US-A-4 490 728 (J.L. VAUGHT et al.) * column 3, lines 22-33; column 4, lines 20-36; claim 1; figures 4-6 *	1-11	
A	PATENT ABSTRACTS OF JAPAN vol. 12, no. 381 (M-752)(3228), 12 October 1988; & JP-A-63134249 (CANON INC.) 06.06.1988 -----	1,3,11	TECHNICAL FIELDS SEARCHED (Int. Cl.5) B 41 J 2/00
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 07-09-1990	Examiner DUCREAU F B
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons ----- & : member of the same patent family, corresponding document			